



*Adaptación al cambio climático  
para el desarrollo local*

# Equity considerations in a comparative analysis of the socio-ecological dynamics in 3 watersheds of Latin America

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*Session “Equity and economic development: interdependencies”*



# Plan

- Introduction: a participatory modelling process that aims at making explicit sustainable issues (including equities) and at constructing collective action
- 1. Representing interactions in the SES to visualize the impacts of economic development on water security: three sites
- 2. The emergence of equity considerations in the representation of socio-ecological dynamics: comparative analysis
- 3. Possible responses to unsustainable dynamics and their implications for equity
- Conclusion: facing CC, a common problem, different types of equity issues



# In the face of climate change, making sustainability issues explicit

Climate change: a “more hostile climate” affecting water flows

For adaptation to CC, water security is a rising challenge, to be understood in relation with economic development

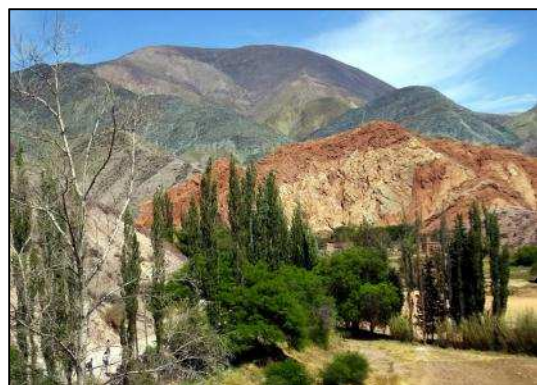
More generally, CC adaptation strategies rely on a better understanding of Socio-Ecological System (SES) dynamics

SES dynamics depend on actors/resources interactions, institutions, and drivers of change

- ➔ How to build up collective action for community-based management to cope with CC?
- ➔ How equity issues arise when addressing CC adaptation ?



# 3 territories and civil society organizations involved in EcoAdapt



Bosque Modelo Jujuy (BMJ, AR)



Bosque Modelo Chiquitano (BMCh, BO)



Bosque Modelo Araucarias de Alto Malleco (BMAAM, CL)

# Institutional characteristics of the 3 territories

|   | <b>BMJ, AR</b>   | <b>BMCh, BO</b>                 | <b>BMAAM, CL</b>                            |
|---|--|---------------------------------|---|
| <b>Dominant type of regulation</b>      | Hierarchy + collective action  | Community + state interventions | Market                                      |
| <b>Organization of water regulation</b> | Irrigation consortium  | Municipality                    | State authority                             |
| <b>Water use priority definition</b>    | Decree with priority principle<br>(1) Human cons.,<br>(2) irrigated agriculture<br>(tobacco, sugarcane, vegetable,...)<br>(3) hydropower<br>(4) industry | Depend on community decision    | Water use rights regulated by market forces |



# Representing interactions in the SES, (P)ARDI conceptual modelling process

Adapted from ARDI (Etienne et al, 2011)

|   | <b>P</b>   | <b>- AR-DI</b>   | <b>PAR-D-I</b>  | <b>PARDI</b>  |
|---|--|--|---|---|
| <b>Object-ives</b>                              | Issue / Problematic definition   | Actors and Resources identification  | Dynamic and Interaction characterization                      | Synthesis, <b>conceptual model</b> building   |
| <b>Protocol</b>                                 | Ecoadapt Synthesis workshop (+ stakeholders' workshops)                | Ecoadapt Synthesis workshop<br>Bibliographical revision (including Ecoadapt materials) | -Workshops<br>-Focus groups<br>-Interviews<br>-Secondary data | -Data analysis<br>- Researcher / BM staff dialogue<br>-Workshops (building or validation) |
| <b>Main source of Information and knowledge</b> | Mainly based on existing accumulated knowledge from BM and researchers |  | Mainly based on new information raised from stakeholders      |   |





Actor

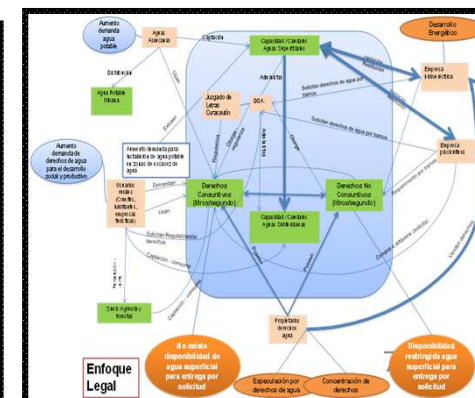
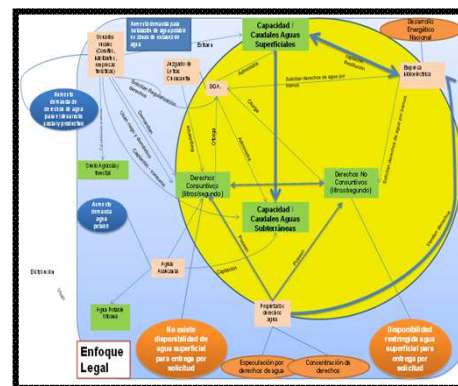
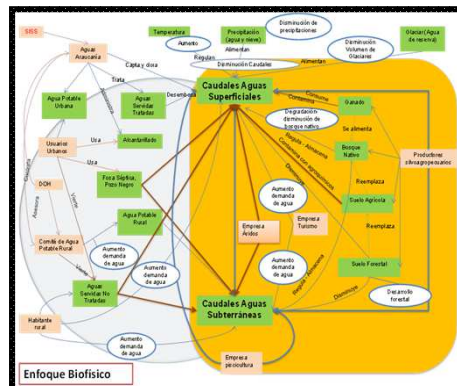
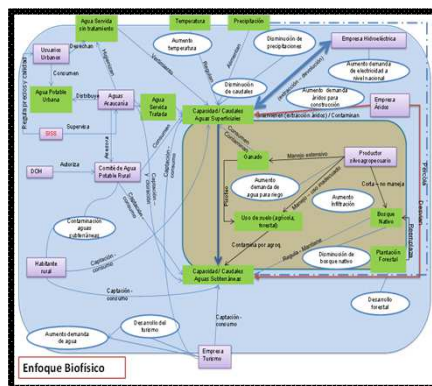
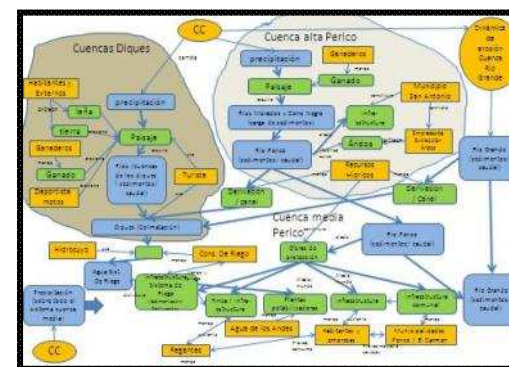
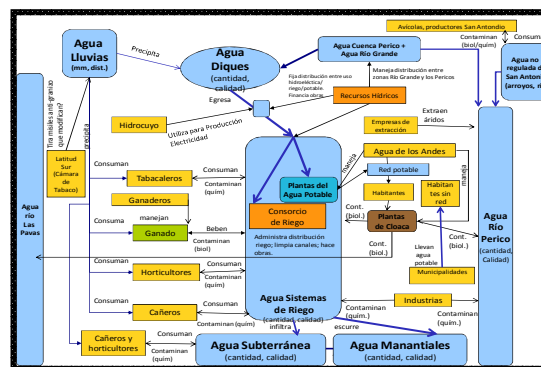
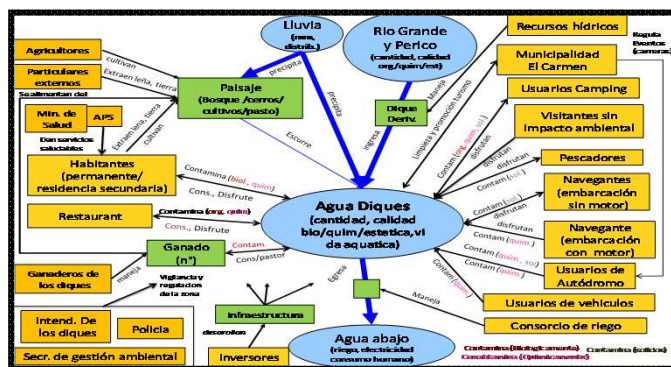
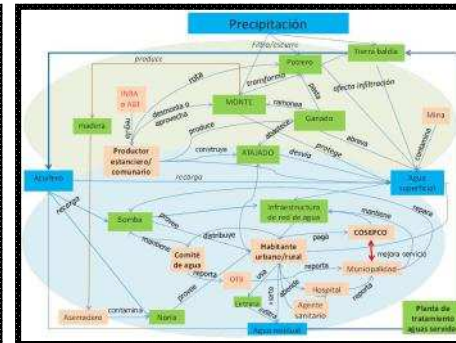
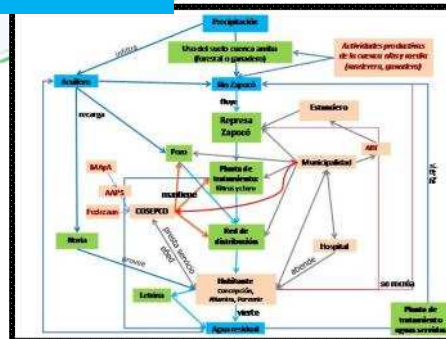
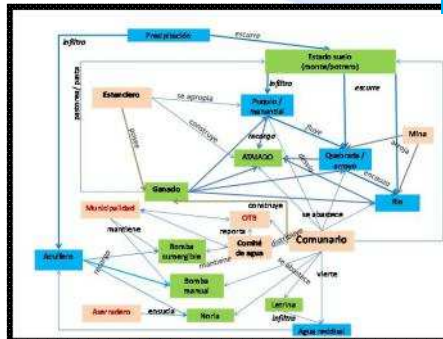
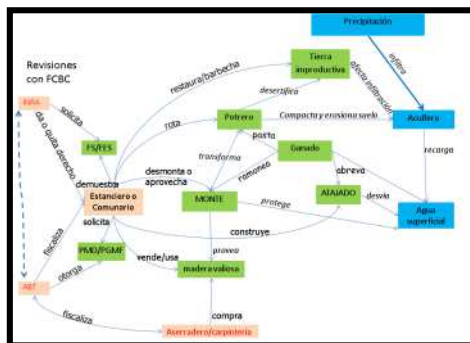
interaction

Resource

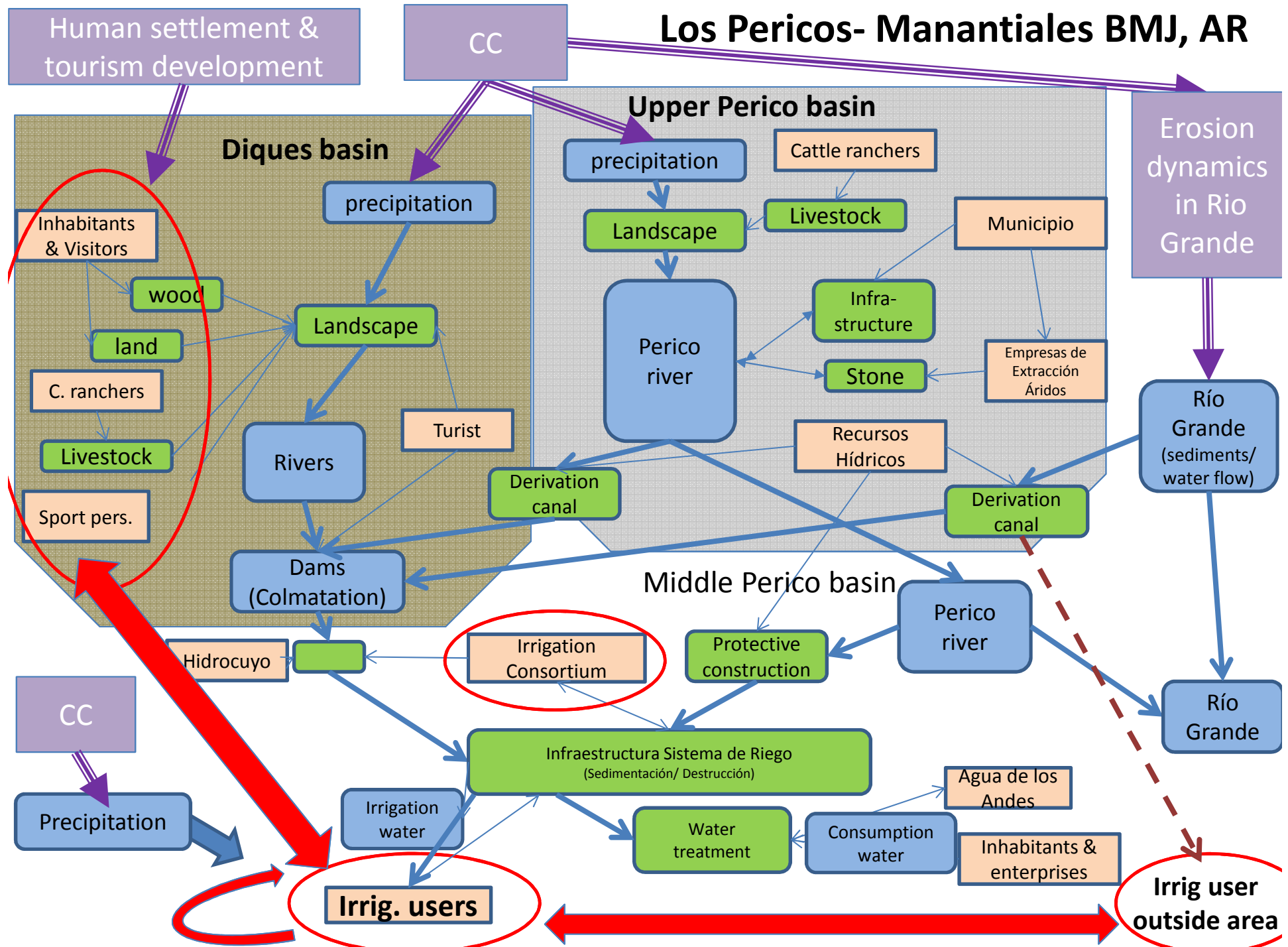
interaction

dynamic

Water Res.

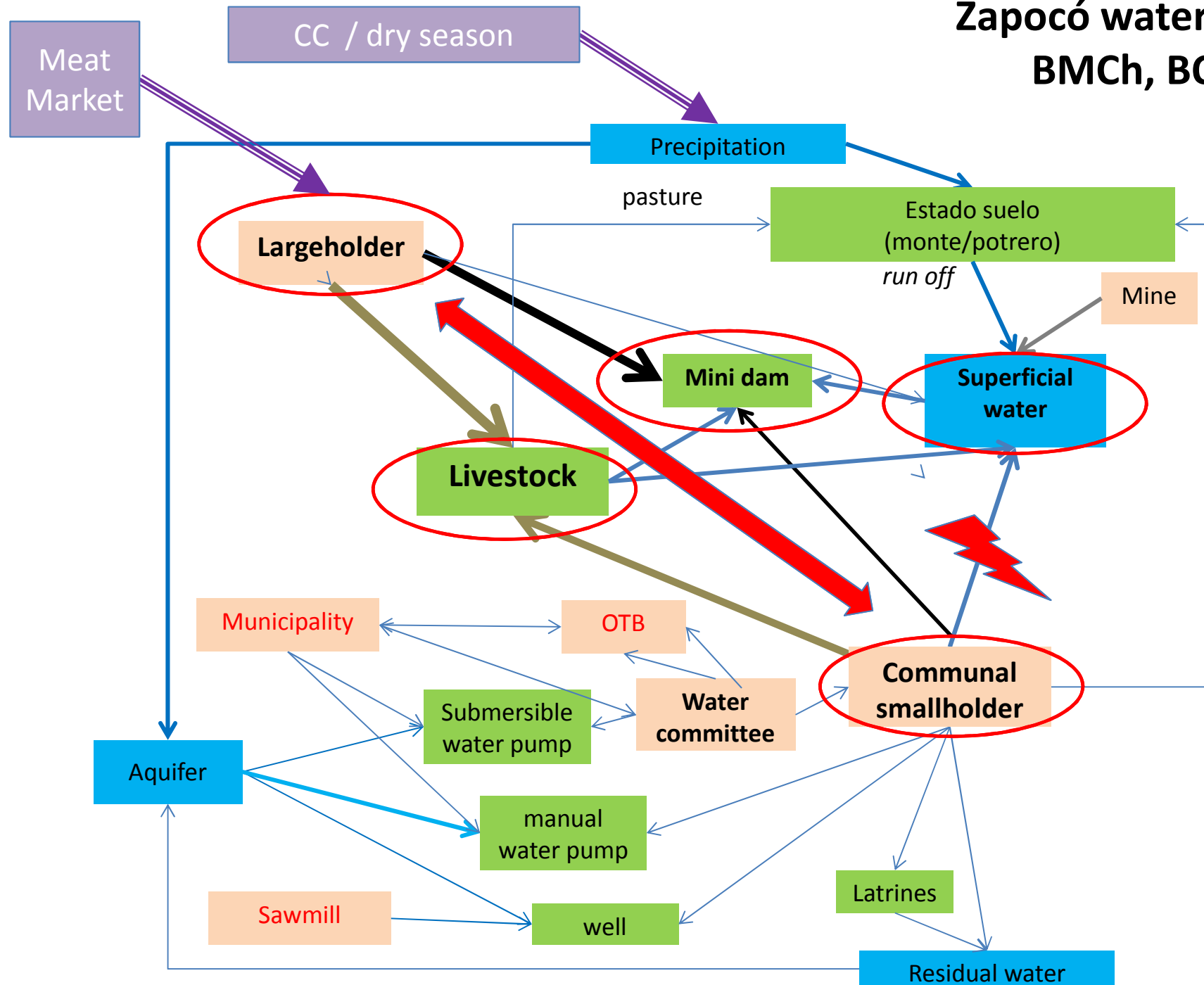


# Los Pericos- Manantiales BMJ, AR

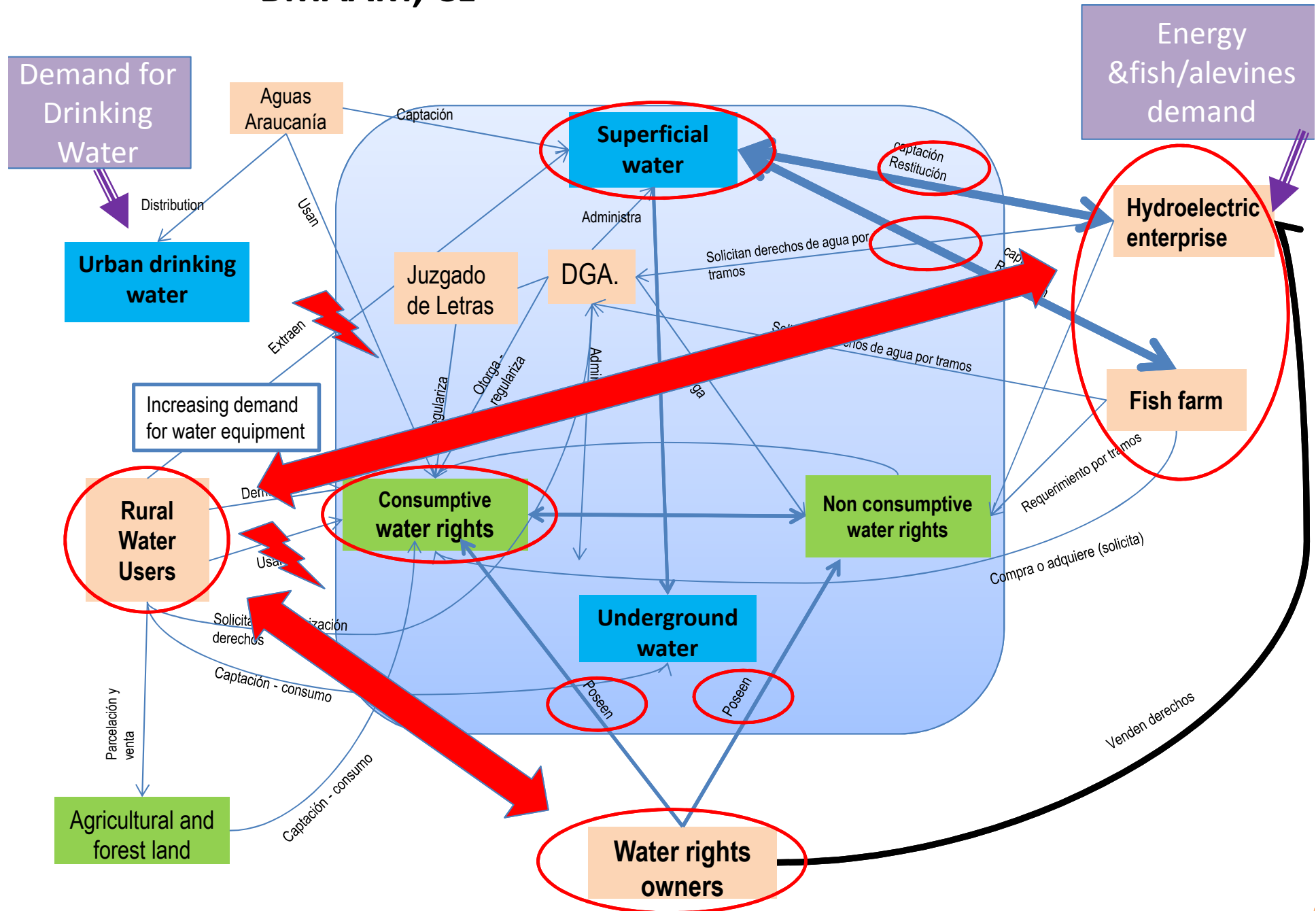




# Zapocó watershed BMCh, BO



# BMAAM, CL



# The emergence of equity considerations different aspects

## **In terms of economic power**

- BMJ: upstream vs. downstream actors, in land use activities and agricultural intensification/artificialization
- BMCh: large holders – smallholders in livestock production
- BMAAM: water right owners vs. land owners for the development of new activities

➔ Differences of perspective

## **In terms of environmental externalities issues and legal backing:**

- BMJ: dependence towards the practices of upstream actors and lack of collective response
- BMCh: controversies given specific support to communal producers and lack of law enforcement
- BMAAM: non consumptive rights affecting more than expected water security and lack of effective monitoring

➔ Latent conflicts

# Conclusion

- Equity problem emerge in CC adaptation issue, even in intents to collectively set solutions
- Whatever institutions (Governance structure), equity issue remains
- Diversity of equity issues according to socio-ecosystems
- Further step
  - Define scenarios and adaptation plan
  - Analyze scenarios and adaptation option with an attention on equity issue



A photograph of a tropical landscape. In the foreground, there is a field of green grass and low-lying vegetation. Several tall palm trees are scattered across the scene, with one particularly large one on the left. In the background, there is a dense line of trees and foliage. The sky is filled with large, white, fluffy clouds, and the sun is visible, creating a bright, slightly overexposed area in the upper right. The overall scene is peaceful and natural.

Thank you

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